

ON A NEW BOPYRID PARASITE FROM THE COAST OF NEW SOUTH WALES.

By WILLIAM J. DAKIN, D.Sc., F.Z.S., F.L.S.,

Professor of Zoology, University of Sydney.

(Plate xiv; nine Text-figures.)

[Read 29th July, 1931.]

This new genus and species of a Bopyrid parasite is represented by ten females and four male specimens. A much greater number might easily have been obtained, for considerable numbers of the host—a prawn of the group Penaeidae—have been caught by trawlers off the coast of New South Wales, and practically every prawn of the sample obtained for examination* is parasitized. The host prawn has, up to now, been regarded as rare; it is certainly so in collections, but as it is a species found in deeper water and not one of those which regularly invade the estuaries it is probably much more abundant than has been recognized.

Genus CRASSIONE, n. gen.

The genus may be described as follows: A Bopyrid parasite allied to the group *Orbione*, *Parapenaeon* and *Epipenaeon*, the type species being an ectoparasitic branchial parasite under the branchiostegites of a Penaeid prawn of the genus and species *Aristeus foliaceus*. The sexes are dimorphic. The body of the female (Plate xiv, fig. 1) is oval in shape, the greatest width being about midway between the anterior and posterior extremities. The anterior end is broad, the posterior end triangular ending narrowly. The body is asymmetrical but either the one side or the other may be reduced—in other words there are “left-handed” and “right-handed” specimens. The head is distinct from the thorax. It bears a well developed frontal lamina. No eyes are present. The thoracic segments are distinct and the pleural lamellae† of all the segments are well developed. On the highly developed (or non-reduced side) they have the form of broad plates, as in *Orbione* and its related genera *Epipenaeon* and *Parapenaeon*. The incubatory cavity is completely closed.

The abdomen of the female is small, only one-fifth the length of the animal. The somites are clearly defined, including the last or sixth, which is somewhat small. All are visible dorsally. Pleural lamellae are developed only on the first five abdominal segments. Five pairs of biramous pleopods are present and in addition the uropods are also biramous. The abdominal pleura, the pleopods, and uropods all bear tubercles and tend to resemble each other. The only known species is of considerable size amongst Bopyrids, the length of the females reaching 15 millimetres with a breadth of 10 mm.

* Many were apparently eaten by the trawler's crew.

† Also called pleura and epimera by various authors.

Male (Plate xiv, fig. 2).—The body is much smaller than the female and has the general characters of the males of *Epipenaeon* and *Parapenaeon* species. Eyes are absent. The thoracic segments are distinct and their lateral margins rounded. All the abdominal somites are fused to form one mass and no trace of pleopods or uropods is to be found.

Genotype.—*Crassione aristaei*, n. gen. et sp.

Note on genus.—There is a small and well defined group of Epicarid parasites restricted to prawns of the group Penaeidae. Up to the present they fall into the genera *Orbione* Bonnier; *Parapenaeon* Richardson; *Epipenaeon* Nobili; *Gigantione* Kossman; and *Orbiomorphus* Richardson. There is a very general resemblance between the genera, more especially in the character of the female thorax. To distinguish between them one has to take the female abdomen as a guide. And even in this criterion there is confusion. The differences as accepted at present (by Nierstrasz and Brandis, and by Chopra) may be set out as follows:

1. Only five abdominal segments visible in the female.

(a) Pleural lamellae on the five segments all well developed. Uropods biramous *Epipenaeon*

(b) Pleural lamellae not so well developed and only on the first four abdominal segments. Only four pairs of pleopods *Orbiomorphus*

2. Six abdominal segments visible in the female.

(a) Pleural lamellae present on all six abdominal segments. Uropods uniramous *Orbione*

(b) Pleural lamellae present on five abdominal segments only.

Uropods uniramous *Parapenaeon*; *Gigantione*

Uropods biramous *Crassione*, n. gen.

The confusion has arisen through two notes by Miss Richardson; one rather unexpected statement in 1910 was to the effect that the uropods of *Parapenaeon* were biramous. She herself had previously named and described this genus in 1904 and diagnosed the type species as having uniramous uropods. This position does not appear to have ever been properly cleared up, but Nierstrasz and Brandis not only found Miss Richardson's species in the Siboga collection but another and new species, and as these authorities affirm that the uropods are really uniramous (as first described) the matter must stand at that, at present.

The other and perhaps still more serious statement refers to the genus *Orbione*. Both Bonnier and Nobili used the uniramous character of the uropods as an essential feature in the diagnosis of this genus. Miss Richardson said, however, that the uropods were biramous and contradicted Bonnier. Chopra refuses to accept her view, but it is of great interest, for it may be taken to indicate a difficulty in the interpretation of the last abdominal segment and its appendages. Unless, however, Miss Richardson is correct and Bonnier, Nobili, Chopra and others wrong, there is no doubt that our genus differs from all the others in having abdominal pleura on only five segments with six segments present, and biramous uropods on the last. It is advisable in this connection, to point out the following facts: The abdominal pleura become increasingly large as one passes posteriorly and at a casual glance the last segment, the pleo-telson, might appear to have pleura agreeing in size and general form with those of the preceding segment (the fifth). If one did interpret the almost terminal processes as pleura it would of course be necessary to conclude that the uropods were uniramous, and we should then have agreement with the genus *Orbione*.

Nobili's figure, however, shows the sixth segment definitely continued into the pleural processes. Careful examination clearly reveals the difference in the present

species. The last segment is distinctly marked off from the processes in question, which arise underneath it. The use of the binocular dissecting microscope with powerful illumination makes this very obvious. The processes at the sides of the pleotelson are not pleura but the exopodites of the uropods. They are so sharply marked off that the break can be shown in photographs as indicated in Fig. 1, Plate xiv (see also Text-fig. 1).

This point has been emphasized, for it implies that other species, old and new, should be carefully examined. The possibility of confusion is increased owing to the fact that the exopodites of the pleopods are not unlike their corresponding pleura in appearance (Text-fig. 1). Any resemblance therefore between the exopodites of the uropods and the pleura of the preceding segment is not surprising.

It is interesting to note that Nierstrasz and Brandis make the following remark in their introduction: "Bezüglich der Uropodien müssen wir gestehen dass uns in den Fällen, in welchen sie als Verlängerungen der Seiten des Pleotelsons auftreten und keine Grenzen wahrnehmbar sind, ein criterium fehlt, um sie als Uropodien oder als Seitenplatten zu deuten." In any case the present species is certainly distinct and in view of the facts given above must be made the type of a new genus closely related to *Orbione* and *Parapenaeon*.

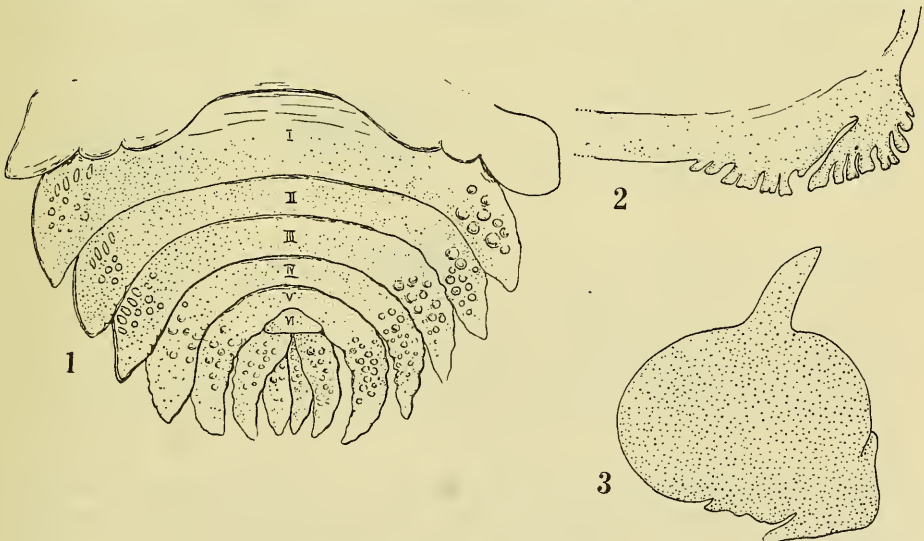
Description of Species.

CRASSIONE ARISTAEI, n. sp.

Female.

Size.—The length of the specimens ranges from 10 mm. to 15 mm. The latter size is the most frequent. The greatest breadth of these individuals is 10 mm. The relation of the cephalon to the peraeon is roughly 5-1.

Cephalon.—As long as broad from the anterior margin of the frontal lamina. The frontal lamina is well developed and projects forward. It is overlapped



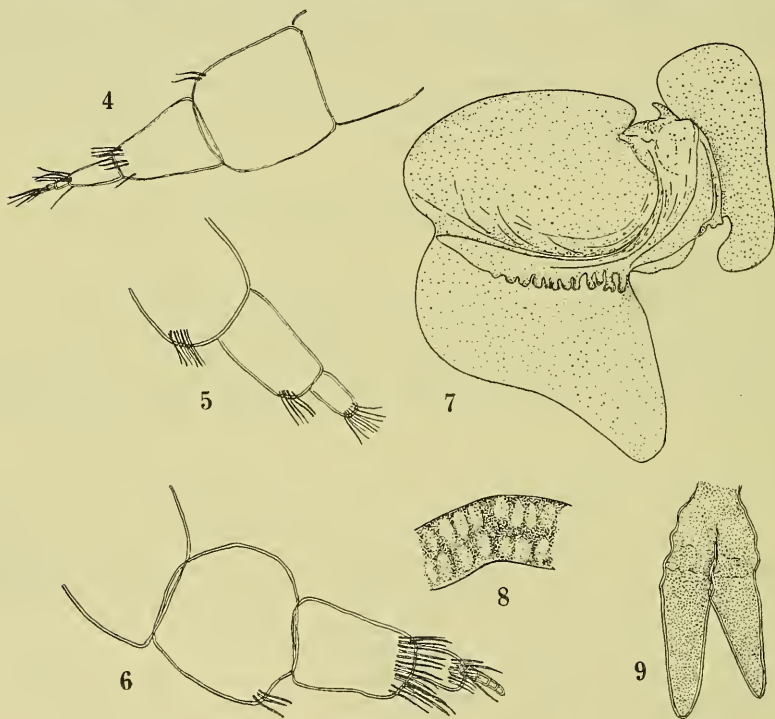
Text-figs. 1-3.—*Crassione aristaei*, n.g. et sp.

1.—Abdomen of female, dorsal view showing biramous uropods of last segment between the pleura of preceding segment. $\times 15$. 2.—Posterior ventral margin of frontal lamina—left half only shown. $\times 18$. 3.—Maxillipede of left side. $\times 13$.

slightly at the sides by the first pleura. Its full length is longer than the breadth of the head. Eyes are absent. Posterior lamina of the head with branched processes on distal margin (Text-fig. 2). Maxillipede (Text-fig. 3) flattened and with flat cone-like endopodite not unlike that of *Orbione* species (*O. halipora* N. & B. for example).

The antennule is three-jointed and not very different from that of the male (Text-fig. 5). The antenna (Text-fig. 4) is composed of four large segments and three, possibly four, very small terminal ones making seven or eight altogether.

Peraeon.—The thoracic segments (see Plate xiv, fig. 1) are all distinctly marked off from one another, although there is a tendency for this to be less so in the median line in connection with the anterior free segments 3, 4 and 5 (the first free thoracic segment is of course really the second thoracic segment). The first



Text-figs. 4-9.—*Crassione aristaei*, n.g. et sp.

- 4.—Antenna of female. $\times 100$. 5.—Antennule of male. $\times 150$. 6.—Antenna of male. $\times 170$. 7.—First pereopod with oostegite, view of inner face. $\times 10$. 8.—Ventral surface of an abdominal segment of female. $\times 19$. 9.—Uropod of female. $\times 15$.

four free segments bear very well developed pleura, particularly on the undeformed side. These plates, like those of *Orbione* species, project freely anteriorly and posteriorly. They have a characteristic shape and their free margins are delicate, without any conspicuous crenulation or cuts, although there may be slight undulations. On the undeformed side each pleuron overlaps the one in front and thus extends quite a little distance in front of its own segment. The pleura of the

posterior three segments of the undeformed side of the thorax appear as continuations of the entire margin of the segments; they are somewhat triangular in shape. The sixth overlaps the seventh and there is a steady diminution in size.

On the ventral surface the oostegites (Text-fig. 8) overlap so that the marsupium is completely enclosed.

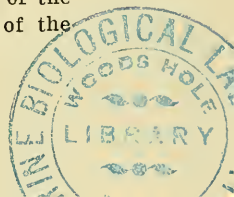
Abdomen.—The abdomen is about one-fifth the total length of the body and about as broad as long. All the six segments are distinct, the last being quite small. The pleura are pointed and leaf-like tuberculate plates. On the non-deformed side the first pleuron is distinctly smaller than the last thoracic pleuron of this side, and the size somewhat increases so that the fifth is the largest. On the deformed side of the animal the abdominal pleura escape the reduction so obvious in the thoracic region. In fact, the abdominal pleura of this side are slightly better developed than those of the other side and the first abdominal pleuron of the deformed side is actually larger than the last thoracic pleuron.

The ventral surface of the abdomen bears five pairs of biramous pleopods and one pair of biramous uropods. The external ramus of the latter is very like the pleuron of the fifth segment in size and shape. The tips of the exopodites of the pleopods may only just be seen from the dorsal surface—the exopodites of the uropods are of course fully exposed. The pleopods are tuberculate and the ventral surface of the abdominal segments between them also bears little elevations (Text-fig. 8).

Male.—Averages about 4.3 mm. long and 1.7 mm. broad. As in *Orbione*, *Epipenaeon* and *Parapenaeon* the abdomen exhibits a complete fusion of all the segments and there is no trace of pleopods or uropods. The illustration gives the proportion and shape of the head and thoracic segments which increase in breadth slightly to the fourth. The thoracic segments are very distinct, for each lateral margin projects considerably and there are very deep indentations between segments. Eyes are absent. The antennules (Text-fig. 5) are three-jointed, the antennae (Text-fig. 6) 7 or 8-jointed. The proportion of the joints is shown in the figures. It would appear from the literature as if the antennae of allied species had never been examined with a high power. One wonders, therefore, whether the number of antennal joints noted above is characteristic of the present species because it is greater than the number usually found in the allied forms, or whether the smaller terminal joints have been overlooked in those species. As a matter of fact the number of joints is frequently given in diagnosis.

Notes on the Species.—Every prawn examined, with the exception of one, was parasitized. Only one female and its male partner were present, the male lying across the abdomen of the female. Owing to the large size of the female parasite its presence is exactly noted externally, by reason of the large bulge occasioned on the branchiostegite covering it. Sometimes the parasite is on the left side of the prawn, sometimes on the right, but always lying with its head directed towards the host's posterior end. A parasite from the right side of the host has its left side deformed or reduced, whilst one from the left side of the host has its right side reduced. No indication of any external effect of the parasite on the sexual characters of the host was noted, but in this species of prawn the secondary sexual differences are very slight and in any case we had not enough non-parasitized specimens to enable us to recognize minute modifications. It is doubtful whether any occur.

This new species of Bopyrid is distinguished by the following features of the female: (1) Size and relation of length and breadth; (2) the character of the



segments and appendages of the abdomen; (3) the incubatory cavity; (4) the characters of the frontal lamina, the head and thoracic pleura; and (5) possibly by the number of segments in the antennae.

Locality.—The prawn host upon which the species is found was trawled off the coast of New South Wales (off Eden) in 50 fathoms.

The holotype is in the Australian Museum Collection, No. P.9966.

Classification.—It being necessary to erect a new genus, the name *Crassione* is selected. The specific name chosen for the Holotype and type species of the genus is *aristaei*, from the genus of prawns, *Aristeus*, on which it is parasitic.

The systematic position is then as follows:

Class Crustacea.

Div. Peracarida.

Order Isopoda.

Sub-Order Epicaridea.

Tribe Bopyrina.

Genus *Crassione*.

Bibliography.

A considerable number of articles have been referred to, but since an excellent bibliography has been given by Chopra and by Nierstrasz and Brandis, only the more significant works concerned in this paper need be indicated.

BONNIER, J.—Contribution a l'études des Epicarides des Bopyridae. *Trav. Stat. Zool. Wimereux*, viii, 1900.

CHOPRA, B.—Indian Bopyrid Isopods. *Rec. Indian Museum*, xxv, 1923.

NIERSTRASZ, H. F., and BRENDER A BRANDIS.—Die Isopoden der Siboga Expedition, Epicaridea, Siboga Exped. Rep., xxxii, 1923.

NOBILI, G.—Nuovi Bopiridi. *Atti R. Accad. Sci. Torino*, xli, 1906.

RICHARDSON, HARRIET.—Contributions to the Natural History of the Isopoda. *Proc. U.S. Nat. Mus.*, xxvii, 1904.

———, Marine Isopoda collected by the U.S. Fisheries Steamer "Albatross," *Doc. U.S. Bur. Fisheries*, No. 736, 1910.

EXPLANATION OF PLATE XIV.

Fig. 1.—Female *Crassione aristaei*, n.g. et sp., dorsal view. × 6.

Fig. 2.—Male *Crassione aristaei*, n.g. et sp., dorsal view. × 15.